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ZEUXINE STRATEUMATICA IN FLORIDA

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THE OCCURRENCE of the Asiatic *Zeuxine strateumatica* in Florida was reported in *Orchidologia Zeylanica* 4 (1937) 89. This report was based on a single colony found on January 17, 1937, in a nursery, the Ormond Tropical Gardens, at Ormond in Volusia County. It was suggested that this orchid might have been introduced with nursery stock, but convincing evidence for such an introduction was lacking and efforts to substantiate it met with failure. Records of *Zeuxine strateumatica* having been cultivated in American gardens have not been found. It is not an orchid of horticultural significance and to my knowledge has never been cultivated in our botanic gardens.

Shortly after the discovery of *Zeuxine strateumatica* at Ormond, my attention was directed to a photograph representing several plants of this species collected by George Nelson on January 27, 1936, west of Fellsmere in Indian River County. These plants, unlike those found at Ormond, grew at a distance from cultivated ground. In January, 1938, Nelson again visited the Fellsmere area and reported that *Zeuxine strateumatica* was sparingly distributed over a stretch of two miles and was apparently spreading. The original colony was a small one although composed of numerous specimens.

In December, 1937, Donovan S. Correll brought to my laboratory for identification an orchid which had been collected by Charles C. Deam, on January 30, of that year, twelve miles southeast of Kissimmee in Osceola County. This proved to be conspecific with the Ormond plants and with those found by Nelson near Fellsmere. Later (February, 1938) Correll sent in additional records for the occurrence of the species, indicating its presence in Highlands County, Collier County, Hendry County and Glades County. These were localities visited by Mr. Deam. Then Correll reported that specimens had been found on January 22, 1938, by Miss Mary Singeltary near Kissimmee growing on the edge of a swamp on Johnson Island.

These records indicate very clearly that *Zeuxine strateumatica* is already widespread in peninsular Florida and appears to be adapted to Floridian soil and climate. At the season of anthesis, in 1938, there were frosts in Ormond, but the flowers of the orchid did not show frost-injury although mulberry trees were completely defoliated.

In January, 1938, I again visited the Ormond Tropical Gardens and found an abundance of specimens. Along the edges of a drainage ditch the plants were numerous, in one case fifteen flowering stalks being found in an area of less than one square foot of ground. Some of these specimens were so luxuriant that the lower part of the stems had become procumbent, a condition I have never observed in plants collected in the eastern tropics. The smallest specimens were hardly 4 cm. tall, one of these bearing a single flower, perhaps being a very young plant blooming for the first time.

When I first saw *Zeuxine strateumatica* in lawns of the Ormond Tropical Gardens, I was inclined to believe that it had been introduced from China with seeds of

Centipede Grass (*Eremochloa ophiuroides*). Centipede Grass, now common in Florida as a lawn-grass, was introduced in 1917 from regions in China where *Zeuxine strateumatica* is a native, and the length of time since the introduction of the grass to the United States would seem to be commensurate with the length of time it has taken for the orchid to become naturalized. Protocorms of *Zeuxine* might well have been distributed with stolons of *Eremochloa ophiuroides* and in the course of time might have established themselves in favorable locations. But until we discover definite information in this regard conjecture must of necessity be our only recourse.

As efforts to trace the introduction of *Zeuxine strateumatica* to Florida have failed, it might seem that this is so because the species has been a native for a very long time; that it is a species with representatives in both hemispheres and comparable in this respect to *Eulophia alta* and *Polystachya luteola*, orchids known for many years to be components of the flora of Florida. On this assumption it would have to be argued that the plant has escaped attention until recently and is just coming to the notice of botanists. To argue thus would be quite justifiable if the localities where *Zeuxine strateumatica* has been found were just now being explored for the first time and were remote from travelled paths and from human habitations and if the plants proved to be confined because of their dependence on special soils to limited areas from which they have been unable to spread. But the simultaneity of the reported discoveries of colonies in widely separated areas near thoroughfares and in the vicinity of human dwellings constitute rather convincing evidence that the species is a recent newcomer rather than a native being noticed for the first time in regions where it has escaped observation for untold decades. Intensive botanical exploration has been in progress many

years where the species has been found. Where it occurs it exhibits the propensities of a weed and has become amenable to a diversity of conditions, growing in clipped lawns, under shrubs, along ditches, and thriving equally in sun or shade.

The behavior of *Zeuxine strateumatica* is remarkably unlike that of any other orchid I have observed. As is well known, our native terrestrial species are extremely fastidious. With few exceptions they exhibit intolerance of human contacts. Even though we endeavor to supply the delicate balance of soil conditions revealed necessary by scientific research they seem to resent attempts made to cultivate them in our gardens. *Zeuxine strateumatica* behaves as if it were adapted to the disturbing influences usually associated with cultivated ground and this was strikingly evident in the Ormond Tropical Gardens where the plants survive the clipping of lawns and the cultivation of the soil beneath shrubs.

The roots of the plant are provided with endophytic fungi. From cultures made at the Biological Laboratories by John N. Porter, the fungal symbiont would seem to be a species of *Rhizoctonia* with typical monilioid conidial chains. Attempts to germinate the seeds in association with this fungus have failed, but failure may be the result of the methods used rather than evidence of incompatibility. The likelihood that the fungus isolated is a species other than the one on which mycorrhizal association depends is of course a possibility.

Zeuxine strateumatica is rather unusual in the brevity of its floral maturation in Florida. It comes into flower in January and in a very few weeks sets an abundance of fertile seeds. By the middle of March the withered stems, leaves and inflorescence have completely vanished. In early April I was unable to find a trace of the plant in the Ormond Tropical Gardens and transplanted colonies

in my garden at Ormond, with one exception, were without a vestige of superterranean parts. In passing it may be emphasized that many terrestrial orchids appear to be prevalently subterranean in their nature, the stems, leaves and flowers being but a brief stage in the developmental history. Noteworthy examples of this are the species of *Triphora* including *T. trianthophora*, and the remarkable Australian species *Rhizanthella Gardneri* and *Cryptanthemis Slateri*, the latter a small herbaceous saprophyte wholly subterranean with the exception of the flowers which just reach the surface of the ground. It is as if the production of flowers were but an interlude in the vegetative life of the plant, something incidental to ensure wide distribution of the species. Whether or not the flowers of *Zeuxine strateumatica* are self-pollinated is a question for which the answer is yet to be found, but the rapidity of seed maturation and the abundance of fertile seeds (often polyembryonic) may be regarded as in a measure bound up with the extraordinary rapidity with which the species is becoming established in peninsular Florida.

Zeuxine strateumatica (*Linn.*) *Schlechter* in Engl. Bot. Jahrb. 45 (1911) 394.

Orchis strateumatica Linnaeus Sp. Pl. ed. 1 (1753) 943.

Pterygodium sulcatum Roxburgh Hort. Beng. (1814) 63, *nomen*; Fl. Ind. ed. 2, 3 (1832) 452.

Spiranthes strateumatica Lindley in Bot. Reg. 10 (1824) sub t. 823.

Strateuma zeylanica Rafinesque Fl. Tellur. pt. 2 (1837) 89.

Zeuxine sulcata Lindley Gen. & Sp. Orch. Pl. (1840) 485.

Adenostylis strateumatica Ames Orch. 2 (1908) 59.

EXPLANATION OF THE ILLUSTRATION

ZEUXINE STRATEUMATICA (*Linn.*) *Schltr.* Three plants, drawn natural size, from specimens found growing spontaneously in Ormond, Florida. 1, a side view of the labellum and column. 2, the labellum showing the pandurate lamina and shallow sac. 3, the dorsal sepal. 4, a petal. 5, a lateral sepal. 6, the pollinium. Figs. 1-6 much enlarged.

Drawn in January 1937 by BLANCHE AMES



ZEUXINE *strateumatica* (L.) Schltr.

FLORIDA: Volusia County, Ormond, in the Ormond Tropical Gardens. January 17, 1937, also January 13, 1938. *Ames*: Indian River County, State Road west of Fellsmere. January 27, 1936, also January 21, 1938. *George Nelson*: Osceola County, twelve miles southeast of Kissimmee in moist sand in the bottom of a roadside ditch. January 30, 1937. *Charles C. Deam*; Edge of swamp, Reedy Creek Swamp, Johnson Island, Kissimmee. January 22, 1938. *Mary Singeltary*: Highlands County, along Road 8 south of Lake Placid. February 1, 1938. *Deam*; On State Road just north of Venus. February 1, 1938. *Deam*: Glades County, along road, two to three miles south of Lakeport. February 1, 1938. *Deam*: Hendry County, in mucky soil just south of the levee at Clewiston on border of a swamp. February 2, 1938. *Deam*: Collier County, along roadside north of Naples. February 4, 1938. *Deam*.